In the Claims

1. (Currently Amended) An MRI apparatus comprising:

a magnetic resonance imaging (MRI) system having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field and an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MR images; and

a computer programmed to determine, in real-time, a respective flip angle for each data acquisition pulse of a pulse sequence for multi-echo acquisition of MR data matched to a given target tissue with known T1 and T2, and a given scan prescription such that a target amplitude for a majority of echoes in the multi-echo acquisition is substantially uniform and a maximum echo amplitude of the majority of echoes is substantially equal to the target amplitude. ~~to reduce ringing artifacts from amplitude decay of the multi-echo acquisition.~~

2. (Original) The MRI apparatus of claim 1 wherein the computer is further programmed to determine the respective flip angle for each data acquisition pulse to maintain cumulative RF deposition during data acquisition within a prescribed level.

3. (Currently Amended) The MRI apparatus of claim 1 wherein the computer is further programmed to determine the respective flip angle from a selection of one of a number of stored polynomial expressions of available flip angle trains, the selected polynomial expression being most optimal of the number of stored polynomial expressions for the given target tissue T1 and T2 and the given scan prescription.

4. (Currently Amended) The MRI apparatus of claim 3 wherein the computer is further programmed to determine a most optimal polynomial expression from a target amplitude desired for ~~a~~the majority of echoes of the multi-echo acquisition.

5. (Original) The MRI apparatus of claim 3 wherein the computer is further programmed to determine a flip angle train for the pulse sequence from the number of stored polynomial expressions that will provide a least noisy image of the target tissue relative to flip angles of non-selected polynomial expressions of stored polynomial expressions.

6. (Original) The MRI apparatus of claim 1 wherein the computer is further programmed to determine the respective flip angle for each data acquisition pulse based on data acquisition being carried out with a polarizing magnetic field of at least 1.5 Tesla.

7. (Original) The MRI apparatus of claim 1 wherein the computer is further programmed to determine the respective flip angle for each data acquisition pulse of the pulse sequence based at least on T1 and T2 characteristics of the given target tissue.

8. (Original) The MRI apparatus of claim 1 wherein the computer is further programmed to acquire 2D or 3D MR data with a fast spin echo pulse sequence.

9. (Withdrawn) A method of MR imaging comprising the steps of:

receiving a user input of a given tissue targeted for MR data acquisition and at least one parameter of a scan to acquire MR data;

determining an echo train duration time for a multi-echo acquisition of MR data for a scan carried out with the at least one parameter to acquire MR data with contrast of the given tissue;

determining a target amplitude for a majority of echoes of the multi-echo acquisition; and

determining a flip angle for each data acquisition pulse of the multi-echo acquisition to acquire MR data such that, for the majority of the echoes of the multi-echo acquisition, a maximum echo amplitude is substantially equal to the target amplitude.

10. (Withdrawn) The method of claim 9 wherein the steps of determining an echo train duration time and a target amplitude further comprise determining the echo train duration time and the target amplitude through a numerical solution of Bloch equations.

11. (Withdrawn) The method of claim 9 wherein the at least one scan parameter includes one of sequence type, field of view, and receiver bandwidth.

12. (Withdrawn) The method of claim 9 wherein the steps of determining an echo train duration time a target amplitude further comprise determining the echo train duration time

and the target amplitude based at least on the tissue type and T1 and T2 characteristics of the tissue type.

13. (Withdrawn) The method of claim 9 wherein the step of determining a flip angle further comprises determining the flip angle from a polynomial expression selected from a database of stored polynomial expressions.

14. (Withdrawn) The method of claim 9 wherein step of determining a flip angle further comprises determining the flip angle for each data acquisition pulse on-the-fly.

15. (Withdrawn) A computer readable storage medium having a computer program stored thereon and representing a set of instructions that when executed by a computer causes the computer to:

determine a target amplitude versus echo train time relationship for a multi-echo acquisition of MR data from a given target tissue;

determine a desired maximum amplitude for a plurality of echoes of the multi-echo acquisition for a user-prescribed MR scan from the target amplitude versus echo train time relationship; and

determine a flip angle for each data acquisition pulse of the prescribed MR scan such that the plurality of echoes has a maximum amplitude substantially equal to the desired maximum amplitude.

16. (Withdrawn) The computer program of claim 15 wherein the set of instructions further causes the computer to determine the flip angle for each data acquisition pulse for the multi-echo acquisition from one of a number of flip angle trains stored in a database.

17. (Withdrawn) The computer program of claim 16 wherein the set of instructions further causes the computer to determine a flip angle train for the user-prescribed MR scan, the flip angle train having a linear portion, a non-linear portion, and a constant portion.

18. (Withdrawn) The computer program of claim 17 wherein the set of instructions further causes the computer to execute a polynomial fit of the non-linear portion of the flip angle

train to determine the flip angle of the data acquisition pulses to be played out to acquire data from echoes occurring during the non-linear portion of the flip angle train.

19. (Withdrawn) The computer program of claim 15 wherein the set of instructions further causes the computer to automatically select the desired maximum amplitude for each data acquisition pulse of the user-prescribed MR scan based on a user selection of desired scan parameters and the given target tissue.

20. (Withdrawn) The computer program of claim 15 wherein the set of instructions further causes the computer to determine the flip angle for each data acquisition pulse such that amplitude decay during the multi-echo acquisition is substantially uniform.

21. (New) An MRI apparatus comprising:

a magnetic resonance imaging (MRI) system having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field and an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MR images; and

a computer programmed to determine, in real-time, a respective flip angle for each data acquisition pulse of a pulse sequence for multi-echo acquisition of MR data matched to a given target tissue and a given scan prescription to reduce ringing artifacts from amplitude decay of the multi-echo acquisition wherein the computer is further programmed to determine the respective flip angle from a selection of one of a number of stored polynomial expressions of available flip angle trains, the selected polynomial expression being most optimal of the number of stored polynomial expressions for the given target tissue and the given scan prescription.